DESCRIPTION

CLEANING TOOL, AND METHOD FOR MANUFACTURING CLEANING PORTION CONSTITUTING THE CLEANING TOOL

TECHNICAL FIELD

This invention relates to a cleaning tool used for wiping, and to a method for manufacturing a cleaning component that constitutes part of a cleaning tool.

BACKGROUND ART

A duster has been used in the past as a cleaning tool for dusting chests and other such furniture, computers, lighting, and other such electrical products, and the interior walls, thresholds, molding, and so forth of buildings.

A duster has a structure in which a plurality of cord-like strips are attached to the distal end of a handle component, and dust is removed by brushing a dusty surface with these cord-like strips. Therefore, a conventional duster has no wiping function, and so can not remove dust without scattering it into the air.

In an attempt to ameliorate this drawback to dusters, a cleaning tool in which a cleaning cloth equipped with a wiping component and a dusting component is provided to a head at the distal end of a handle component has been proposed in Japanese Laid-Open Patent Application H10-43115. With this cleaning tool, however, the wiping component did not offer satisfactory wiping performance, and the tool was also inconvenient to use.

In Japanese Laid-Open Patent Application 2000-83883 has been proposed a hand wiper comprising a handle component, a head component, and cleaning cloth, with a main body constituted in the middle of the head component, and a thin-walled flexible component formed around the periphery of the main body. However, this hand wiper did not offer satisfactory wiping performance, either, and furthermore it was incapable of cleaning well in confined spaces.

It is an object of the present invention to provide a cleaning tool that wipes away dirt very well and also provides satisfactory cleaning ability in tight spaces.

It is another object of the present invention to provide a method for manufacturing a cleaning component, with which a cleaning component that constitutes part of a cleaning tool can be manufactured easily.

DISCLOSURE OF THE INVENTION

The present invention is a cleaning tool comprising a cleaning component and a handle component, wherein the cleaning component comprises a bulging component bent in a U-shape, a handle insertion component formed on the inside of the bulging component, and a pleated component formed along and underneath the bulging component.

With the present invention, a sheet bundle cut surface is formed at the upper part of the bulging component, which allows a raised nap to be formed at the upper part of the bulging component.

Also, with the present invention, the bulging component has a pleated component on its upper portion, but the pleated component can also be formed in the bulging component itself. In this case, the pleated component is constituted by cuts formed at the top end of the bulging component.

The method for manufacturing a cleaning component comprises a step of forming a narrow rectangular pleated component by making numerous cuts respectively on one side and the other side of a sheet bundle comprising a plurality of stacked sheets, a step of bending the sheet bundle in two so that the pleated component on one side overlaps with the

pleated component on the other side (first bending step), a step of forming a seal component near the pleated component of this bent sheet bundle to form a bulging component demarcated from the pleated component, a step of further bending the sheet bundle in two so that the pleated components overlap with one another (second bending step), and a step of linking the bent ends together.

To form a sheet bundle cut surface at the upper part of the bulging component and thereby form a raised nap at the upper part of the bulging component, cut lines should be made along the bend line in the first bending step of the sheet bundle.

To form the pleated component in the bulging component itself, cut lines should be made along the bend line in the first bending step of the sheet bundle, and numerous cuts made in the cut end surface of this cut line.

Since the pleated component is formed on the cleaning surface with the present invention, the pleated component can get into tight spaces and irregular surfaces, allowing dust to be trapped and wiped away more effectively, and allowing tight spaces to be cleaned more easily.

With the present invention, a pleated component is formed by making cuts in a sheet bundle comprising a plurality of stacked sheets, and the sheet bundle is bent so

that the pleated components overlap with one another (first bending step), and after this first bending, second bending is performed so that the pleated components again overlap with each other, thereby bending the bulging component in a U-shape, so there are many pleats per unit of surface area, allowing the pleated component as a whole to be more voluminous, the result of which is that wiping performance is excellent.

Because there is a bulging component with the present invention, the handle insertion component can be formed in this bulging component, and as a result there is no need to stick together separate sheets in order to form the handle insertion component. Also, when a sheet bundle cut surface is formed at the upper part of the bulging component so as to form a nappy surface, or when the pleated component is formed in the bulging component itself, the bulging component can be constituted as the cleaning surface, and as a result two surfaces (the pleated component underneath the bulging component and the top surface of the bulging component) function as cleaning surfaces, which improves cleaning efficiency and makes the tool more convenient to use.

An advantage to the method of the present invention for manufacturing a cleaning component is that a cleaning

component with good wiping performance can be manufactured easily, with a simple procedure.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1(a) is a front view of the cleaning tool in a first aspect of the present invention, and Fig. 1(b) is a plan view of the same;

Fig. 2(a) is a front view of the cleaning tool in a second aspect of the present invention, and Fig. 2(b) is a plan view of the same;

Fig. 3(a) is a front view of the cleaning tool in a third aspect of the present invention, and Fig. 3(b) is a plan view of the same;

Figs. 4(a) and 4(b) illustrate an example of a method for manufacturing a cleaning component that constitutes a part of the cleaning tool in the first aspect of the present invention;

Figs. 5(a) and 5(b) illustrate an example of a method for manufacturing a cleaning component that constitutes a part of the cleaning tool in the second aspect of the present invention;

Figs. 6(a) and 6(b) illustrate an example of a method for manufacturing a cleaning component that constitutes a

part of the cleaning tool in the third aspect of the present invention;

Fig. 7(a) is a front view illustrating an example of the handle component in the present invention, and Fig. 7(b) is a plan view of the same;

Fig. 8 is a front view of the handle component when folded;

Fig. 9(a) is a vertical cross section of the folding mechanism of the handle component, and Fig. 9(b) is a vertical cross section along the D-D line in Fig. 7(a);

Fig. 10(a) is a plan view illustrating another aspect of the handle component, and Fig. 10(b) is a plan view illustrating a state in which the grip component of the handle component in Fig. 10(a) is extended;

Fig. 11(a) is a vertical cross section along the E-E line in Fig. 10(a), and Fig. 11(b) is a cross section illustrating a state in which the protrusion in Fig. 11(a) has been pushed in;

Fig. 12(a) is a detail side view illustrating the joint portion of the support component and the grip component of the handle component in Fig. 10(a), and Fig. 12(b) is a detail side view illustrating a state in which the stopper of the grip component in Fig. 12(a) has been moved;

Fig. 13(a) is a detail vertical cross section of around the stopper in Fig. 12(a), and Fig. 13(b) is a detail vertical cross section of around the stopper in Fig. 12(b); and

Fig. 14(a) is a detail vertical cross section of around the joint portion in Fig. 12(a), and Fig. 14(b) is a detail vertical cross section of around the joint portion in Fig. 12(b).

BEST MODE FOR CARRYING OUT THE INVENTION

Fig. 1 shows a first embodiment of the present invention. A cleaning tool 1 comprises a cleaning component 2 and a handle component 5, and the cleaning component 2 comprises a bulging component 40 bent in a U-shape, a handle insertion component 3 formed inside the bulging component 40, and a pleated component 4 formed along and underneath the bulging component 40. The cleaning component 2 is constituted such that a sheet bundle comprising a plurality of stacked sheets is bent twice as discussed below (in Fig. 1, 7 is the first bent component and 9 is the second bent component). A linear seal component 6 is provided, parallel to the bent component 7, to the sheet bundle that has been bent from the bent component 7. The space formed by the

provision of this seal component 6 constitutes the handle insertion component 3. The seal component 6 is formed by heat fusion, for example. 8a and 8b are insertion openings in the handle insertion component 3.

Providing the first seal component 6 parallel to the bent component 7 also encompasses situations in which the first seal component 6 is inclined somewhat with respect to the bent component 7, or is curved.

The pleated component 4 has a narrow rectangular shape, and as will be discussed below, this narrow rectangular pleated component 4 can be formed by making numerous cuts on each side of the sheet bundle.

There are no restrictions on the width of the narrow rectangle, but 0.5 to 5 mm is preferable, and 1 to 3 mm is better yet. If the width is less than 0.5 mm, the pleated component 4 may be prone to tearing, but if it is wider than 5 mm, it may be too wide to fit into narrow grooves, which diminishes its ability to trap dust.

There are no restrictions on the length of the narrow rectangle, but 20 to 100 mm is preferable, with 30 to 90 mm being more preferable, and 40 to 70 mm even better. If the length is less than 20 mm, the pleated component 4 may be too short to wipe away dust efficiently, but if it is longer

than 100 mm, it may be too long to be handled easily, and the pleated components 4 may become tangled in clumps.

As shown in Fig. 1, it is preferable to provide a notch 11 at the upper end of the bent component 9 in the cleaning component 2 (that is, at the distal end of the bulging component 40). This structure affords easier bending during the second bending so that the pleated components 4 are lined up with each other after the formation of the seal component 6 on the bent sheet bundle. Providing the notch 11 also makes it easier to push the distal end of the cleaning component 2 into tight spaces, which makes it easier to clean tight spaces.

After the sheet bundle is bent for the second time to curve the bulging component 40 in a U-shape, a connector 12 is provided to link the bent ends together. The connector 12 may be provided anywhere on the bulging component 40, but is preferably provided near the ends of the insertion openings 8a and 8b of the handle insertion component 3. Examples of connecting means include heat fusion, stitching, and other such methods.

The bulging component 40 and the pleated component 4 are provided integrally, but in another embodiment of the present invention they may be created separately and then connected by heat fusion, stitching, or another such method.

The sheets that make up the sheet bundle of the present invention are preferably composed of short fibers. Short fibers have the function of trapping and holding dust in their tiny voids, and therefore are favorable as a material for wiping up dust.

There are no particular restrictions on the short fibers that make up the sheet, but synthetic fibers are preferable in that a sheet bundle can be easily produced by stacking a plurality of sheets and then heat pressing them.

There are no particular restrictions on the synthetic fibers, but composite fibers produced by covering polyester having a low melting point with polyethylene having a high melting point. Composite fibers constituted in this way have good rigidity, as well as excellent flexibility, which makes them excellent for wiping up dust. Also, heat fusion is easier because the fibers retain their shape even if the temperature is set on the high side with respect to the polyethylene during the heating and fusion.

Examples of sheets composed of short fibers include woven and nonwoven cloth, but nonwoven cloth is preferable because of its excellent dust absorption and abrasion resistance. Examples of nonwoven cloth include spunlaced nonwoven, spunbond nonwoven, suction bonded nonwoven, suction heat bonded nonwoven, and melt blown nonwoven.

There are no restrictions on the number of sheets that make up the sheet bundle of the present invention, but 2 to 10 is preferable, and 3 to 6 is even better.

Fig. 2 illustrates a second embodiment of the present invention. In this embodiment, a sheet bundle cut surface 15 is formed on the upper part of the bulging component 40, which forms a raised nap on the upper part of the bulging component 40. To form this raised nap on the upper part of the bulging component, cut lines should be made along the bend line in the first bending step of the sheet bundle. A nappy surface is formed in the course of this sheet cutting.

Also, in this embodiment two seal components, a first seal component 6 and a second seal component 17, are provided as the seal component, and the space formed by these two seal components constitutes the handle insertion component 3.

Fig. 3 illustrates a third embodiment of the present invention. In this embodiment, a pleated component 16 is provided to the bulging component 40 itself. The pleated component 16 is provided to the upper part of the bulging component 40, and has the same narrow rectangular shape as the pleated component 4 under the bulging component 40.

To form this pleated component 16 on the upper part of the bulging component 40, a cut line is made along the bend

line in the first bending step of the sheet bundle, and numerous cuts are made along the cut end faces of this cut line.

Again in this embodiment, two seal components, a first seal component 6 and a second seal component 17, are provided as the seal component, and the space formed by these two seal components constitutes the handle insertion component 3.

Next, an example of the method for manufacturing the cleaning component 2 will be described through reference to Figs. 4 to 6.

First, a sheet is manufactured by piling up short fibers and heat pressing them.

A plurality of sheets are then stacked to form a sheet bundle 21.

Next, as shown in Figs. 4(a), 5(a), and 6(a), seal components 22 and 23 are provided to both ends in the lengthwise direction of the sheet bundle 21. The seal components 22 and 23 are preferably formed by heat fusion accomplished by heating and pressing.

Next, two rows of narrow rectangular pleated component 4 are formed by making numerous cuts 26 and 27 in one side 24 and the other side 25 of the sheet bundle 21. If the strength of the sheet bundle is directional, then it is

preferable to form the cuts 26 and 27 parallel to the direction of higher strength because this prevents the pleated component 4 from tearing easily.

Simultaneously with the step in which the cuts 26 and 27 are made, a hole 28 is made in the center of the sheet bundle 21. There are no restrictions on the shape of the hole 28, but as shown in Figs. 4(a), 5(a), and 6(a) this shape is preferably a circle having two peak-shaped protrusions in the direction of the first bend line (A-A line) passing through the center of the sheet bundle 21. It is preferable for the hole 28 to be formed in this way because, as shown in Figs. 1(a), 2(a), and 3(a), the notch 11 will be linear, which makes it easier to bend the cleaning component 2 from the bending component 9, and also the distal end of the cleaning component 2 will have a pointed shape, which makes it easier to push into tight spaces during cleaning.

When the cleaning component 2 in the second embodiment is manufactured, a cut line 30 is made along the first bend line (A-A line) as shown in Fig. 5(a) prior to moving on to the next step. Making this cut line 30 allow a raised nap to be formed on the cut surface thereof.

When the cleaning component 2 in the third embodiment is manufactured, a cut line 30 is made along the first bend

line (A-A line) and numerous cuts 31 and 32 are made along the cut end surfaces of this cut line 30 as shown in Fig. 6(a) prior to moving on to the next step. Making these cuts 31 and 32 allow the narrow rectangular pleated component 16 to be formed in the bulging component 40 itself.

Next, the sheet bundle 21 is bent in two along the first bend line (A-A line) so that the pleated component 4 on the one side 24 will overlap with the pleated component 4 on the other side 24 (first bending step).

The seal component 6 is then formed near the pleated component 4 as shown in Fig. 4(b). Heat fusion is the preferred means for forming the seal component 6. In the second and third embodiments the second seal component 17 is provided in addition to the seal component 6, a suitable distance away (Figs. 5(b) and 6(b)).

The result of thus forming the seal component 6 is that the bulging component 40 is formed demarcated from the pleated component 4, a space is formed on the inside of this bulging component 40, and this space constitutes the handle insertion component 3. In the second and third embodiments the space (handle insertion component 3) is formed between the two seal components 6 and 17.

Next, in the first, second, and third embodiments, as shown in Figs. 4(b), 5(b), and 6(b), respectively, the sheet

bundle 21 is bent in two so that the pleated components 4 overlap with each other along the second bend line (B-B line) that passes at a right angle through the center of the first bend line (A-A line) (second bending step). This bend yields the cleaning component 2. The first bend line (A-A line) corresponds to the bent component 7, while the second bend line (B-B line) corresponds to the bent component 7.

The bulging component 40 is curved in a U-shape as a result of the second bending step described above. Next, the U-shape is fixed by linking through heat fusion or the like near the insertion openings 8a and 8b in the handle insertion component 3 of the bulging component 40. This yields the cleaning component 2 comprising the bulging component 40 curbed in a U-shape and the pleated component 4 formed along and underneath the bulging component 40.

Support members 10a and 10b of the handle component 5 are inserted into the handle insertion component 3 through the insertion openings 8a and 8b, respectively, in the handle insertion component 3 of the cleaning component 2 formed as above, and the cleaning component 2 is fixed to and supported by the distal end of the handle component 5. The cleaning component 2 is removably attached to the handle component 5.

The handle component in the present invention comprises a grip component and a support component, and therefore can have any of a variety of configurations.

Plastic, metal, wood, and other such materials can be used for the handle component, but plastic is preferred in terms of light weight and low cost. When a plastic is used as the material, a polyethylene resin, polypropylene resin, or other polyolefin resin is preferable in that they are easier to mold.

Preferred aspects of the handle component that constitutes part of the cleaning component of the present invention will be described through reference to Figs. 7, 8, and 9.

The handle component 5 comprises a grip component 42 and a support component 10, and the support component 10 is made up of a support member 10a and a support member 10b.

The spacing between the support member 10a and the support member 10b provided to the handle component 5 is preferably wider than the spacing between the insertion opening 8a and the insertion opening 8b of the handle insertion component 3. If it is, then when the support members 10a and 10b are inserted into the handle insertion component 3, the spacing between the support members 10a and 10b will be narrowed, and after this insertion into the

handle insertion component 3 the restitutive force of the support members 10a and 10b will be exerted outwardly, so that the support members 10a and 10b are securely held in the handle insertion component 3, which keeps the support members 10a and 10b from readily coming loose from the handle insertion component 3 during cleaning.

V-shaped notches 41 are provided as shown in Fig. 7 to the outsides of the two support members 10a and 10b. The notch angle α on the distal end side of the support component 10 of the notches 41 is preferably large, and the notch angle β on the grip component side of the notches 41 is also preferably large. When notches 41 such as these are provided, they make it easier to insert the support members 10a and 10b into the handle insertion component 3, and the support members 10a and 10b are less apt to come out of the handle insertion component 3, which prevents the support members 10a and 10b from coming out of the handle insertion component 3 during cleaning.

The support component 10 and the grip component 42 are bendable, and the support component 10 and the grip component 42 also can both be fixed in an extended state.

A receiver 44 is provided at the base of the support component 10, an insertion component 45 is provided at the distal end of the grip component 42, a recess 46 that mates

with the insertion component 45 is provided inside the receiver 44, a bearing hole 49 is provided to the side walls 47 and 48 within the recess 46 formed in the receiver 44, and a shaft 50 provided to the side walls 51 and 52 of the insertion component 45 is rotatably supported in the bearing hole 49.

A latching protrusion 54 is provided to the ceiling 53 of the receiver 44, and a latching recess 55 in which the latching protrusion 54 can fit is provided in the top surface 56 of the insertion component 45. The grip component 42 is rotated around the shaft 50 until the insertion component 45 enters the recess 46 and the latching protrusion 54 inside the recess 46 is fitted into the latching recess 55 of the insertion component 45. This puts the grip component 42 and the support component 10 in their extended state. When the grip component 42 is rotated in the opposite direction from that described above, the latching protrusion 54 is separated from the latching recess 55, allowing the grip component 42 to be stowed underneath the support component 10.

Further, the receiver 44 may be provided to the grip component 42 and the insertion component 45 to the support component 10, and the latching protrusion 54 may be provided

to the insertion component 45 and the latching recess 55 to the receiver 44.

Fig. 10(a) illustrates another aspect of the handle component used in the cleaning tool of the present invention. The handle component in the aspect illustrated in Fig. 10(a) is constituted such that the support component 10 consisting of the two support members 10a and 10b and a grip component 61 can be bent at a connector 63, and the grip component 61 extends.

With the handle component in the aspect illustrated in Fig. 10(a), there is a void inside the grip component 61, a core 62 is housed in this void, and the grip component 61 covers the outside of the core 62 and is fitted slidably in the lengthwise direction with respect to the core. As shown in Fig. 10(b), the handle component extends and elongates when the grip component 61 is slid in the lengthwise direction of the core 62.

A protrusion 67 is provided as shown in Fig. 10 near the end in the lengthwise direction of the core 62. Also, through-holes 65 and 66 that mate with the above-mentioned protrusion 67 are provided near the two ends in the lengthwise direction of the grip component 61. As shown in Fig. 10(a), when the grip component 61 is retracted, the protrusion 67 of the core 62 fits into the through-hole 66

at the rear end of the grip component 61. As shown in Fig. 10(b), when the grip component 61 is extended, the protrusion 67 of the core 62 fits into and is fixed in the through-hole 65 at the front end of the grip component 61. The grip component 61 is fixed in the desired position by fitting the protrusion 67 into either of the through-holes 65 and 66. The protrusion 67 also prevents the grip component 61 from being pulled out too far and coming loose from the core 62 when the grip component 61 is extended.

As shown in Fig. 11(a), in a state in which the protrusion 67 of the core 62 is fitted into the through-hole 66 (or 65) of the grip component 61, the grip component 61 is latched so that it will not readily move with respect to the core 62. As shown in Fig. 11(b), the portion at the end of the core 62 where the protrusion 67 is formed is thinner than the other portion. When the grip component 61 is slid, the protrusion 67 is pushed down with a finger as shown in Fig. 11(b), which pushes the protrusion 67 into the space inside the grip component 61, allowing the protrusion 67 to be easily unlatched from the through-hole 66 and making it possible for the grip component 61 to slide as desired with respect to the core 62.

The handle component in the embodiment shown in Fig. 10(a) folds in two at the connector between the grip

component and the support component, and an anti-folding mechanism is provided so that when the product is being used in a state in which these two components are extended, this extended state will be maintained and the components will not readily fold together. Specifically, as shown in Figs. 12(a) and 12(b), the anti-folding mechanism comprises a stopper 64 formed slidably in the lengthwise direction of the core 62, and a latching tab 68 that juts our from the side wall of the connector 63 of the support component 10.

As shown in Fig. 12(a), to fix everything so that the grip component will not rotate in a state in which the grip component has been linearly extended with respect to the support component, the stopper 64 is slid in the lengthwise direction of the core 62 until it presses against the connector 63. In this state, the upper end of the stopper 64 on the connector 63 side is against the latching tab 68 and cannot move upward. In contrast, as shown in Fig. 12(b), when the stopper 64 is slid along the core 62 toward the grip component in the lengthwise direction of the core, the stopper 64 is no longer in contact with the latching tab 68. When the stopper 64 has been slid in this way, the core 62 can be rotated about 180° around a rotary shaft 69 pivoting on the connector 63 of the support components 10a and 10b, and thereby folded in two.

The stopper 64 is formed so as to move no more than necessary when the core 62 has been slid in the lengthwise direction away from the latching tab 68. As shown in Figs. 13(a) and 13(b), a cylindrical protrusion 71 is provided to the upper surface of the core 62, and a groove-like recess 72 is provided on the cylindrical protrusion 71 side of the stopper 64. This groove-like recess 72 is formed as a wall that is open on the grip side of the stopper 64 and closed on the connector 63 side. As shown in Fig. 13(b), when the stopper 64 has been slid away from the latching tab 68 of the connector 63 in order to allow the core 62 to rotate, the cylindrical protrusion 71 strikes the wall on the connector side of the groove-like recess 72 of the stopper 64, preventing the stopper 64 from sliding any further in the grip direction.

The handle component in the embodiment shown in Fig. 10 is provided with a fixing mechanism comprising, as shown in Figs. 14(a) and 14(b), a hemispherical protrusion 73 provided to the bottom surface and between the side walls at the connector 63, and a hemispherical recess 74 formed so as to mate with the hemispherical protrusion 73, in order to fix the support component and the grip component so that they will not fold when extended linearly. In a state in which the grip component and the support component are

extended straight out, as shown in Fig. 14(a), the hemispherical protrusion 73 of the support component 10 is fixed in a state of being fitted into the hemispherical recess 74 of the core 62. In contrast, when the handle component is to be folded up, as shown in Fig. 14(b), if a fair amount of rotational force is applied to the grip component, the hemispherical protrusion 73 of the support component 10 is released from the hemispherical recess 74 of the core 62, the core 62 and the grip component 61 are rotated, and the support component and the grip component are folded in two.

Because it has the pleated component 4, the cleaning tool of the present invention is able to trap dust effectively. If the sheet bundle cut surface 15 is formed on the upper part of the bulging component 40, or if the pleated component 16 is formed on the bulging component 40 itself, then objects can be wiped clean using not only the lower surface (pleated component 4) of the cleaning tool, but also the upper surface (the pleated component 16 or the nappy surface provided by the sheet bundle cut surface 15).

The cleaning component 2 is a disposable type, and can be replaced with a new cleaning component after new by removing the cleaning component 2 from the handle component 5.

INDUSTRIAL APPLICABILITY

The present invention can be used advantageously in the home and elsewhere as a cleaning tool for dusting chests and other such furniture, computers, lighting, and other such electrical products, and the interior walls, thresholds, molding, and so forth of buildings.